

AMENDMENTS TO THE CLAIMS

1-10. (Cancelled)

11. (Currently Amended) A microfluidic device ~~manufactured comprising:~~

~~by binding a sensing substrate including a sensing electrode, an electrode interconnect, and an electrode pad, with a sensing substrate bound to a channel substrate,~~

the sensing substrate including a sensing electrode, an electrode interconnect and an electrode pad,

the channel substrate including a first fluid inlet port at a side of the channel substrate, a first fluid addition chamber around the first fluid inlet port, a sample reaction barrier-~~connecting~~ a sensing chamber with the first fluid addition chamber, and a second fluid inlet port at the other side of the channel substrate, a second fluid addition chamber around the second fluid inlet port, a channel connecting the second fluid addition chamber and the sensing chamber, and a used reagent reservoir connected to the sensing chamber;

a first fluid comprising a sample for loading into the sensing chamber via the first fluid inlet port and a second fluid comprising a buffer solution for loading into the sensing chamber via the second fluid inlet port;

an external pump for forcing fluid flow from the second fluid inlet port to the sensing chamber; and

wherein the channel substrate is dimensioned such that a sample injected-loaded via the first fluid inlet port flows into the sensing chamber through the first fluid addition chamber solely by capillary force, ~~and stops flowing at~~ the sensing chamber having appreciably large outlets which are larger than an inlet of the sensing chamber such that the capillary force diminishes at the sensing chamber outlets, and a buffer solution loaded via the second fluid inlet port flows by the action of ~~an~~ the external pump through the channel and the sensing chamber, for washing reacted products, and is reserved in the used reagent reservoir.

12. (Original) The microfluidic device of claim 11, further comprising a reaction chamber and a time delay between the reaction barrier and the sensing chamber.

13. (Currently Amended) The microfluidic device of claim 11, wherein the sensing substrate further comprises recesses to correspond to the multiple fluid inlet ports, the chamber, ~~and/or~~ the channel.

14. (Currently Amended) The microfluidic device of claim 12, wherein the sensing substrate further comprises recesses to correspond to the multiple fluid inlet ports, the chamber, ~~and/or~~ the channel.

15. (Original) The microfluidic device of claim 11, wherein one of the sensing substrate and the channel substrate is formed of a hydrophobic material and the other is formed on a hydrophilic material.

16. (Original) The microfluidic device of claim 15, wherein a hydrophobic or hydrophilic material is applied to a local region on the inner surface of the sensing substrate or the channel substrate, with a different degree of hydrophobicity or hydrophilicity with respect to the material composing the corresponding substrate.

17. (Original) The microfluidic device of claim 11, wherein both of the sensing substrate and the channel substrate are formed of a hydrophobic or hydrophilic material with different degrees of hydrophobicity or hydrophilicity.

18. (Previously Presented) The microfluidic device of claim 17, wherein a hydrophobic or hydrophilic material is applied to a local region on the inner surface of the sensing substrate or the channel substrate, with a different degree of hydrophobicity or hydrophilicity with respect to the material composing the corresponding substrate.

19. (Original) The microfluidic device of claim 11, wherein the channel comprises a main channel and a sub-channel branching off from the main channel, and a micro heater is additionally installed in the sub-channel.

20. (Original) The microfluidic device of claim 11, wherein the channel substrate and the sensing substrate are bound together using an adhesive material, are bound using an additional clip-type structure, or are bound by fitting projections formed on one of the channel substrate and the sensing substrate into grooves formed on the other.